

November 13, 2009

10/540,558

1

=> fil reg  
FILE 'REGISTRY' ENTERED AT 15:48:03 ON 13 NOV 2009  
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STRUCTURE FILE UPDATES: 12 NOV 2009 HIGHEST RN 1192299-83-4  
DICTIONARY FILE UPDATES: 12 NOV 2009 HIGHEST RN 1192299-83-4

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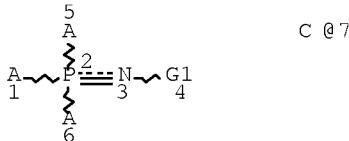
TSCA INFORMATION NOW CURRENT THROUGH June 26, 2009.

Please note that search-term pricing does apply when conducting SmartSELECT searches.

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<http://www.cas.org/support/stngen/stndoc/properties.html>

=> d que stat 18  
L2 STR



VAR G1=7/SI/N/P/O/S

NODE ATTRIBUTES:

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NSPEC IS RC AT 5  
NSPEC IS RC AT 6  
NSPEC IS RC AT 7

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

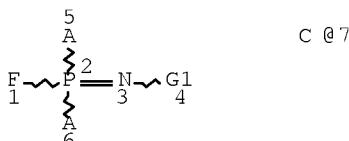
GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 7

STEREO ATTRIBUTES: NONE

L4 93768 SEA FILE=REGISTRY SSS FUL L2  
L5 STR



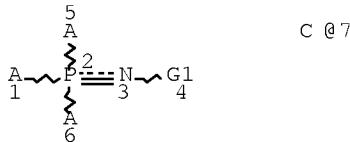
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 NSPEC IS RC AT 6  
 NSPEC IS RC AT 7  
 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
 RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 7

STEREO ATTRIBUTES: NONE  
 L6 SCR 2043 OR 2049  
 L8 222 SEA FILE=REGISTRY SUB=L4 SSS FUL L5 NOT L6

100.0% PROCESSED 294 ITERATIONS 222 ANSWERS  
 SEARCH TIME: 00.00.01

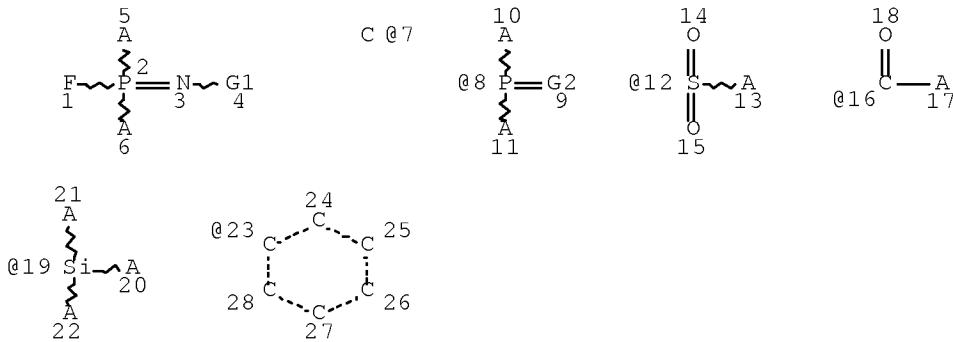
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 L2 STR



VAR G1=7/SI/N/P/O/S  
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 NSPEC IS RC AT 5  
 NSPEC IS RC AT 6  
 NSPEC IS RC AT 7  
 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
 RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 7

STEREO ATTRIBUTES: NONE  
 L4 93768 SEA FILE=REGISTRY SSS FUL L2  
 L6 SCR 2043 OR 2049  
 L9 STR



VAR G1=8/12/16/19/23

VAR G2=0/S/7/SI/N/P

NODE ATTRIBUTES:

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NSPEC	IS RC	AT	13
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NSPEC	IS RC	AT	20
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NSPEC	IS RC	AT	22

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 28

STEREO ATTRIBUTES: NONE

L11            186 SEA FILE=REGISTRY SUB=L4 SSS FUL L9 NOT L6

100.0% PROCESSED      265 ITERATIONS

186 ANSWERS

SEARCH TIME: 00.00.01

=> d his

(FILE 'HOME' ENTERED AT 13:45:26 ON 13 NOV 2009)

FILE 'LREGISTRY' ENTERED AT 13:58:25 ON 13 NOV 2009

L1            STR

L2            STR L1

FILE 'REGISTRY' ENTERED AT 14:12:19 ON 13 NOV 2009

L3            50 S L2

L4            93768 S L2 FUL

FILE 'LREGISTRY' ENTERED AT 14:40:14 ON 13 NOV 2009

L5            STR L2

FILE 'REGISTRY' ENTERED AT 15:28:19 ON 13 NOV 2009

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L6 SCR 2043 OR 2049  
L7 13 S L5 NOT L6 SSS SAM SUB=L4  
L8 222 S L5 NOT L6 SSS FUL SUB=L4  
SAV L8 WEI558S1/A

FILE 'LREGISTRY' ENTERED AT 15:30:05 ON 13 NOV 2009  
L9 STR L5

FILE 'REGISTRY' ENTERED AT 15:37:03 ON 13 NOV 2009  
L10 13 S L9 NOT L6 SSS SAM SUB=L4  
L11 186 S L9 NOT L6 SSS FUL SUB=L4  
SAV L11 WEI558S2/A  
L12 36 S L8 NOT L11

FILE 'HCAPLUS' ENTERED AT 15:38:39 ON 13 NOV 2009  
L13 32 S L12  
L14 58 S L11  
L15 1 S 2004:570217/AN  
L16 84 S L13 OR L14  
L17 QUE ELECTROLY?  
L18 QUE BATTERY  
L19 10 S L16 AND L17  
L20 6 S L16 AND L18  
L21 10 S L19 OR L20  
QUE ADDITIVE? OR ADJUVANT? OR AUXILIAR? OR MODIF?  
L23 QUE AGENT?  
L24 2 S L16 AND L22  
L25 1 S L16 AND L23  
L26 11 S L21 OR L24-25

=> fil hcap  
FILE 'HCAPLUS' ENTERED AT 15:48:46 ON 13 NOV 2009  
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FILE COVERS 1907 - 13 Nov 2009 VOL 151 ISS 21  
FILE LAST UPDATED: 12 Nov 2009 (20091112/ED)  
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Aug 2009  
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Aug 2009

HCAplus now includes complete International Patent Classification (IPC) reclassification data for the third quarter of 2009.

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<http://www.cas.org/legal/infopolicy.html>

This file contains CAS Registry Numbers for easy and accurate substance identification.

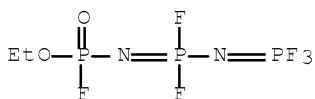
During November, try the new LSUS format of legal status information in the CA/CAPLUS family databases for free! Complete details on the number of free displays and other databases participating in this offer appear in NEWS 10.

=> d ibib abs hitstr hitind 126 1-22

L26 ANSWER 1 OF 11 HCPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 2007:1334246 HCPLUS Full-text  
 DOCUMENT NUMBER: 147:544588  
 TITLE: Nonaqueous electrolyte containing phosphazene compound and lithium ion secondary battery with high discharge efficiency having the same  
 INVENTOR(S): Nakagawa, Hiroe; Katayama, Sadahiro; Nukuta, Toshiyuki  
 PATENT ASSIGNEE(S): GS Yuasa Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007305551	A	20071122	JP 2006-135814	200605 15
PRIORITY APPLN. INFO.:			JP 2006-135814	200605 15

OTHER SOURCE(S): MARPAT 147:544588  
 AB Disclosed is a nonaq. electrolyte made from an organic material consisting of a lithium salt, and a salt at molten state at room temperature containing a (cyclic) phosphazene compound and a quaternary ammonium organic cation.  
 IT 850650-07-6  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (nonaq. electrolyte containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)  
 RN 850650-07-6 HCPLUS  
 CN Phosphoramidofluoridic acid,  
 N-[difluoro[(trifluorophosphoranylidene)amino]phosphoranylidene]-, ethyl ester (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

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ST nonaq **electrolyte** cyclic phosphazene compd lithium ion secondary battery; quaternary ammonium org cation  
IT Secondary batteries  
(lithium; nonaq. **electrolyte** containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)  
IT **Battery electrolytes**  
(nonaq. **electrolyte** containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)  
IT Quaternary ammonium compounds, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(nonaq. **electrolyte** containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)  
IT 33027-66-6 90076-65-6, LiTFSi 132843-44-8, Lithium bis(perfluoroethanesulfonyl)imide 143314-16-3, 1-Ethyl-3-methylimidazolium tetrafluoroborate 174501-64-5, 1-Butyl-3-methylimidazolium hexafluorophosphate 174501-65-6, 1-n-Butyl-3-methylimidazolium tetrafluoroborate 850650-07-6  
RL: TEM (Technical or engineered material use); USES (Uses)  
(nonaq. **electrolyte** containing phosphazene compound for lithium ion secondary battery with high discharge efficiency)

L26 ANSWER 2 OF 11 HCPLUS COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 2007:145522 HCPLUS Full-text  
DOCUMENT NUMBER: 146:232676  
TITLE: Lithium secondary batteries  
suppressing **electrolytes** from  
decomposing at high temperature and their  
cathodes and cathode materials  
INVENTOR(S): Ichihashi, Akira; Kano, Gentaro; Okawa, Takeshi  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 17pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2007035391	A	20070208	JP 2005-215427	200507 26
PRIORITY APPLN. INFO.:			JP 2005-215427	200507 26

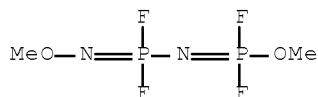
OTHER SOURCE(S): MARPAT 146:232676  
AB The **battery** cathodes contain materials coated with phosphazenes preferably represented by X<sub>3</sub>(X<sub>1</sub>X<sub>2</sub>P:N)nX<sub>4</sub> [X<sub>1</sub>-X<sub>4</sub> = F, Cl, Br, alkoxy, phenyl(oxy); n ≥4]. The cathodes may contain Li- and transition metal-containing active mass compds. **Batteries** containing the cathodes, anodes, and **electrolytes** inside film-type packages are also claimed. The **batteries** show less swelling on high-temperature uses.  
IT 924658-15-1 924658-17-3 924658-23-1

924658-25-3 924658-27-5 924658-28-6

RL: TEM (Technical or engineered material use); USES (Uses)  
 (active-mass coatings; battery cathodes having  
 phosphazene coatings on active masses and suppressing decomposition at  
 high temperature)

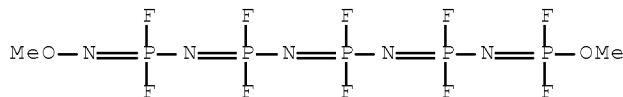
RN 924658-15-1 HCPLUS

CN Phosphorodifluoridimidic acid,  
 N-(P,P-difluoro-N-methoxyphosphinimyl)-, methyl ester (CA INDEX  
 NAME)



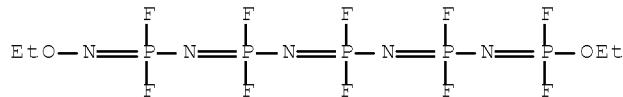
RN 924658-17-3 HCPLUS

CN Phosphorodifluoridimidic acid,  
 N-[N-[N-(P,P-difluoro-N-methoxyphosphinimyl)-P,P-difluorophosphinimyl]-P,P-difluorophosphinimyl]-, methyl ester (CA INDEX NAME)



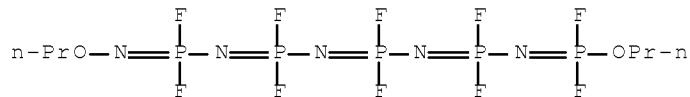
RN 924658-23-1 HCPLUS

CN Phosphorodifluoridimidic acid,  
 N-[N-[N-(N-ethoxy-P,P-difluorophosphinimyl)-P,P-difluorophosphinimyl]-P,P-difluorophosphinimyl]-, ethyl ester (CA INDEX NAME)

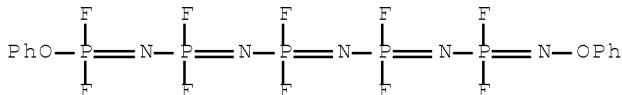


RN 924658-25-3 HCPLUS

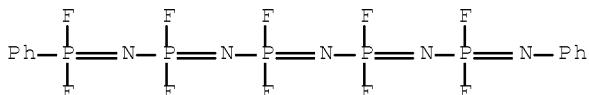
CN Phosphorodifluoridimidic acid,  
 N-[N-[N-(P,P-difluoro-N-propoxyphosphinimyl)-P,P-difluorophosphinimyl]-P,P-difluorophosphinimyl]-, propyl ester (CA INDEX NAME)



RN 924658-27-5 HCAPLUS  
 CN Phosphorodifluoridimidic acid,  
 N-[N-[N-(P,P-difluoro-N-phenoxyphosphinimyl)-P,P-difluorophosphinimyl]-P,P-difluorophosphinimyl]-P,P-difluorophosphinimyl-, phenyl ester (CA INDEX NAME)



RN 924658-28-6 HCAPLUS  
 CN Phosphoramidimidic difluoride,  
 N'-(P,P-difluoro-N-phenylphosphinimyl)-N-[[[[[difluorophenylphosphoranylidene)amino]difluorophosphoranylidene]amino]difluorophosphoranylidene]- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium secondary **battery** cathode phosphazene coating;  
 polydifluorophosphazene **battery** cathode coating high temp  
 swelling prevention  
 IT **Battery electrolytes**  
     (battery cathodes having phosphazene coatings on active  
     masses and suppressing decomposition at high temperature)  
 IT Polyphosphazenes  
     RL: TEM (Technical or engineered material use); USES (Uses)  
     (chlorine-containing, active-mass coatings; **battery**  
     cathodes having phosphazene coatings on active masses and  
     suppressing decomposition at high temperature)  
 IT Polyphosphazenes  
     RL: TEM (Technical or engineered material use); USES (Uses)  
     (fluorine-containing, active-mass coatings; **battery**  
     cathodes having phosphazene coatings on active masses and  
     suppressing decomposition at high temperature)  
 IT Fluoropolymers, uses  
     RL: TEM (Technical or engineered material use); USES (Uses)  
     (gels, **electrolytes**; **battery** cathodes having  
     phosphazene coatings on active masses and suppressing decomposition at  
     high temperature)  
 IT Secondary batteries  
     (lithium; **battery** cathodes having phosphazene coatings  
     on active masses and suppressing decomposition at high temperature)  
 IT Fluoropolymers, uses  
     RL: TEM (Technical or engineered material use); USES (Uses)  
     (polyphosphazene-, active-mass coatings; **battery**  
     cathodes having phosphazene coatings on active masses and  
     suppressing decomposition at high temperature)

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- IT 924658-15-1 924658-17-3 924658-19-5  
924658-21-9 924658-23-1 924658-25-3  
924658-27-5 924658-28-6  
RL: TEM (Technical or engineered material use); USES (Uses)  
(active-mass coatings; ~~battery~~ cathodes having  
phosphazene coatings on active masses and suppressing decomposition at  
high temperature)
- IT 7782-42-5, Graphite, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(anodes; ~~battery~~ cathodes having phosphazene coatings  
on active masses and suppressing decomposition at high temperature)
- IT 12190-79-3, Lithium cobaltate (LiCoO<sub>2</sub>)  
RL: TEM (Technical or engineered material use); USES (Uses)  
(cathode active mass; ~~battery~~ cathodes having  
phosphazene coatings on active masses and suppressing decomposition at  
high temperature)
- IT 21324-40-3, Lithium hexafluorophosphate  
RL: TEM (Technical or engineered material use); USES (Uses)  
(electrolytes, infiltrated in polymer gels;  
~~battery~~ cathodes having phosphazene coatings on active  
masses and suppressing decomposition at high temperature)
- IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer  
RL: TEM (Technical or engineered material use); USES (Uses)  
(gels, electrolytes; ~~battery~~ cathodes having  
phosphazene coatings on active masses and suppressing decomposition at  
high temperature)

L26 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2005:450196 HCAPLUS Full-text

DOCUMENT NUMBER: 142:492196

TITLE: ~~Electrolytic~~ double-layer capacitors  
employing nonaqueous ~~electrolytic~~  
solutions and showing good charge performance

INVENTOR(S): Kanno, Hiroshi; Otsuki, Masami

PATENT ASSIGNEE(S): Bridgestone Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 20 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005135951	A	20050526	JP 2003-367066	200310 28
PRIORITY APPLN. INFO.:			JP 2003-367066	200310 28

AB The capacitors, having porous carbon as electrode active masses, contain  
nonaq. ~~electrolytic~~ solns. and satisfy the ratio of leakage current before and  
after 60° heat stability test ≤60%. The ~~electrolytic~~ solns. may contain  
aprotic solvents and P compds. and/or N compds. The capacitors may satisfy  
charge voltage ≥2.7 V.

IT 22474-63-10, fluorinated, alkoxy-substituted  
852178-24-6 852178-25-7

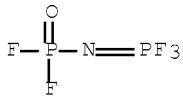
RL: DEV (Device component use); MOA (Modifier or additive use); USES

## (Uses)

(double-layer capacitors containing oligocyclophosphazenes and showing good capacitance holding ratio)

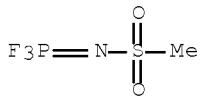
RN 22474-63-1 HCPLUS

CN Phosphorimidic trifluoride, (difluorophosphinyl)- (8CI, 9CI) (CA INDEX NAME)



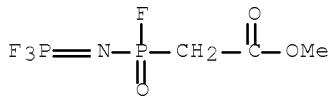
RN 852178-24-6 HCPLUS

CN Methanesulfonamide, N-(trifluorophosphoranylidene)- (CA INDEX NAME)



RN 852178-25-7 HCPLUS

CN Acetic acid, 2-[fluoro[(trifluorophosphoranylidene)amino]phosphinyl]-, methyl ester (CA INDEX NAME)



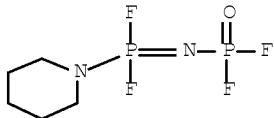
IT 852178-23-5

RL: DEV (Device component use); MOA (Modifier or additive use); USES  
(Uses)

(electrolytic solns.; double-layer capacitors containing oligocyclophosphazenes and showing good capacitance holding ratio)

RN 852178-23-5 HCPLUS

CN Phosphoramidic difluoride, (difluoro-1-piperidinylphosphoranylidene)- (9CI) (CA INDEX NAME)



IC ICM H01G009-038

CC 76-10 (Electric Phenomena)

ST electrolytic double layer capacitor leakage current

- minimized; charge performance electrolytic double layer capacitor; static capacitance holding electrolytic capacitor
- IT Electrolytic capacitors  
 (double-layer; double-layer capacitors containing oligocyclophosphazenes and showing good capacitance holding ratio)
- IT 22474-63-1D, fluorinated, alkoxy-substituted  
 852178-24-6 852178-25-7  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
 (double-layer capacitors containing oligocyclophosphazenes and showing good capacitance holding ratio)
- IT 852178-23-5  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
 (electrolytic solns.; double-layer capacitors containing oligocyclophosphazenes and showing good capacitance holding ratio)

L26 ANSWER 4 OF 11 HCPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 2005:445414 HCPLUS Full-text  
 DOCUMENT NUMBER: 142:492192  
 TITLE: Electrolytic double-layer capacitors employing nonaqueous electrolytic solutions  
 INVENTOR(S): Kanno, Hiroshi; Otsuki, Masatomo  
 PATENT ASSIGNEE(S): Bridgestone Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2005135950	A	20050526	JP 2003-367052	200310 28
PRIORITY APPLN. INFO.:			JP 2003-367052	200310 28

- AB The capacitors contain nonaq. electrolytic solns. preferably containing P compds. and/or N compds. and satisfy static capacitance degradation  $\leq 10\%$  on heat stability test at  $60^\circ$ . The electrolytic solns. may contain aprotic organic solvents. The pos. and neg. electrodes of the capacitors may contain porous carbon (of surface functional group number  $\leq 100$  meq/g) as active masses. The capacitors show charge voltage of  $\geq 2.5$  V and long-term stability of capacitance performance.
- IT 22474-63-1D, ethoxy-substituted derivs.  
 852178-23-5 852178-24-6 852178-25-7  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
 (electrolytic solns.; electrolytic double-layer capacitors containing cyclic oligophosphazenes in nonaq. electrolytic solns.)

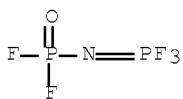
November 13, 2009

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12

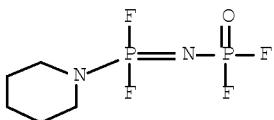
RN 22474-63-1 HCAPLUS

CN Phosphorimidic trifluoride, (difluorophosphinyl)- (8CI, 9CI) (CA INDEX NAME)



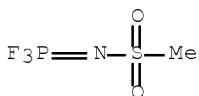
RN 852178-23-5 HCAPLUS

CN Phosphoramidic difluoride, (difluoro-1-piperidinylphosphoranylidene)- (9CI) (CA INDEX NAME)



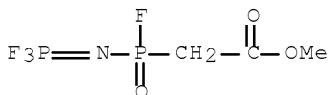
RN 852178-24-6 HCAPLUS

CN Methanesulfonamide, N-(trifluorophosphoranylidene)- (CA INDEX NAME)



RN 852178-25-7 HCAPLUS

CN Acetic acid, 2-[fluoro[(trifluorophosphoranylidene)amino]phosphinyl]-, methyl ester (CA INDEX NAME)



IC ICM H01G009-038

ICS H01G009-058

CC 76-10 (Electric Phenomena)

ST electrolytic double layer capacitor charge performance;  
nonaq electrolytic soln phosphazene contg capacitor;  
porous carbon electrode capacitor long term stability

IT Electrolytic capacitors  
(double-layer; electrolytic double-layer capacitors  
containing cyclic oligophosphazenes in nonaq. electrolytic  
solns.)

IT Carbon black, uses  
RL: DEV (Device component use); USES (Uses)

(electrolytic double-layer capacitors containing cyclic oligophosphazenes in nonaq. electrolytic solns.)

IT Polyphosphazenes

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
 (oligomeric, cyclic, fluorinated, alkoxy-substituted; electrolytic double-layer capacitors containing cyclic oligophosphazenes in nonaq. electrolytic solns.)

IT 7440-44-0, Carbon, uses

RL: DEV (Device component use); USES (Uses)  
 (electrodes; electrolytic double-layer capacitors containing cyclic oligophosphazenes in nonaq. electrolytic solns.)

IT 108-32-7, Propylene carbonate

RL: DEV (Device component use); USES (Uses)  
 (electrolytic double-layer capacitors containing cyclic oligophosphazenes in nonaq. electrolytic solns.)

IT 22474-63-1D, ethoxy-substituted derivs.

852178-23-5 852178-24-6 852178-25-7

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(electrolytic solns.; electrolytic double-layer capacitors containing cyclic oligophosphazenes in nonaq. electrolytic solns.)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L26 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2005:368511 HCAPLUS Full-text

DOCUMENT NUMBER: 142:433056

TITLE: Secondary nonaqueous electrolyte battery

INVENTOR(S): Koto, Tomoko

PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

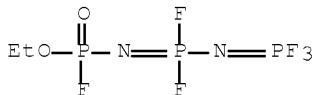
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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-----				
JP 2005116306	A	20050428	JP 2003-348133	200310 07
PRIORITY APPLN. INFO.:			JP 2003-348133	200310 07

AB The battery has a cathode, containing a Li-Ni-Mn composite oxide : Lix NiyMn2-yO4-δ (0< x< 1.1; 0.45< yr< 0.55; and 0≤ δ< 0.4) as a cathode active mass, an anode, and a nonaq. electrolyte solution; where the electrolyte solution contains 0.1-20 mass% phosphazene derivative

IT 850650-07-6

RL: MOA (Modifier or additive use); USES (Uses)  
 (cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium batteries)

RN 850650-07-6 HCAPLUS  
 CN Phosphoramidofluoridic acid,  
 N-[difluoro[(trifluorophosphoranylidene)amino]phosphoranylidene]-,  
 ethyl ester (CA INDEX NAME)



IC ICM H01M010-40  
 ICS H01M004-02; H01M004-58  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST secondary lithium battery cathode lithium manganese nickel  
 oxide; battery electrolyte phosphazene deriv  
 IT Battery cathodes  
     Battery electrolytes  
     (cathodes containing lithium manganese nickel oxides and  
     electrolytes containing phosphazene derivs. for secondary  
     lithium batteries)  
 IT Polyphosphazenes  
 RL: MOA (Modifier or additive use); USES (Uses)  
     (cyclic; cathodes containing lithium manganese nickel oxides and  
     electrolytes containing phosphazene derivs. for secondary  
     lithium batteries)  
 IT Secondary batteries  
     (lithium; cathodes containing lithium manganese nickel oxides and  
     electrolytes containing phosphazene derivs. for secondary  
     lithium batteries)  
 IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate  
 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate  
 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate  
 7782-42-5, Graphite, uses 12031-75-3, Lithium manganese nickel  
 oxide (LiMn1.5Ni0.5O4) 14283-07-9, Lithium tetrafluoroborate  
 21324-40-3, Lithium hexafluorophosphate  
 RL: DEV (Device component use); USES (Uses)  
     (cathodes containing lithium manganese nickel oxides and  
     electrolytes containing phosphazene derivs. for secondary  
     lithium batteries)  
 IT 850650-07-6  
 RL: MOA (Modifier or additive use); USES (Uses)  
     (cathodes containing lithium manganese nickel oxides and  
     electrolytes containing phosphazene derivs. for secondary  
     lithium batteries)  
 OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS  
 RECORD (3 CITINGS)

L26 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 2004:605979 HCAPLUS Full-text  
 DOCUMENT NUMBER: 141:149554  
 TITLE: Separator for nonaqueous-electrolyte  
       double layer capacitor  
 INVENTOR(S): Kanno, Hiroshi; Otsuki, Masami; Eguchi, Shinichi  
 PATENT ASSIGNEE(S): Bridgestone Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.  
 CODEN: JKXXAF

DOCUMENT TYPE:

Patent

LANGUAGE:

Japanese

FAMILY ACC. NUM. COUNT:

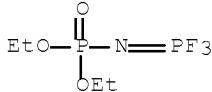
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## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004214356	A	20040729	JP 2002-381018	200212 27
PRIORITY APPLN. INFO.:			JP 2002-381018	200212 27

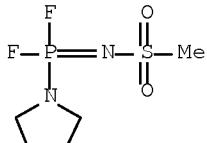
OTHER SOURCE(S): MARPAT 141:149554

- AB A nonflammable separator for a nonaq.-electrolyte double layer capacitor comprises a finely porous film formed by adding a phosphazene derivative (or its isomer) to a polymer. Specifically, the polymer may comprise a polyolefin such as polyethylene or polypropylene.
- IT 722454-84-4 722454-85-5 722454-86-6  
 RL: DEV (Device component use); USES (Uses)  
 (separator containing phosphazene derivative for nonaq.-electrolyte double layer capacitor)
- RN 722454-84-4 HCPLUS
- CN Phosphoramidic acid, (trifluorophosphoranylidene)-, diethyl ester (9CI) (CA INDEX NAME)



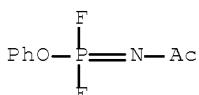
RN 722454-85-5 HCPLUS

CN Phosphonimidic difluoride, N-(methylsulfonyl)-P-1-pyrrolidinyl- (9CI) (CA INDEX NAME)



RN 722454-86-6 HCPLUS

CN Phosphorodifluoridimidic acid, acetyl-, phenyl ester (9CI) (CA INDEX NAME)



IC ICM H01G009-02  
 CC 76-10 (Electric Phenomena)  
 ST phosphazene deriv polymer separator nonaq **electrolyte**  
     double layer capacitor  
 IT Capacitors  
     (double layer; separator containing phosphazene derivative for nonaq.-  
       **electrolyte** double layer capacitor)  
 IT Porous materials  
     (films; separator containing phosphazene derivative for nonaq.-  
       **electrolyte** double layer capacitor)  
 IT Films  
     (porous; separator containing phosphazene derivative for nonaq.-  
       **electrolyte** double layer capacitor)  
 IT Polyolefins  
     RL: DEV (Device component use); USES (Uses)  
       (separator containing phosphazene derivative for nonaq.-  
       **electrolyte** double layer capacitor)  
 IT Phosphazenes  
     RL: DEV (Device component use); TEM (Technical or engineered  
       material use); USES (Uses)  
       (separator containing phosphazene derivative for nonaq.-  
       **electrolyte** double layer capacitor)  
 IT 2397-48-0 9002-88-4, Polyethylene 9003-07-0, Polypropylene  
     722454-84-4 722454-85-5 722454-86-6  
     724792-60-3  
     RL: DEV (Device component use); USES (Uses)  
       (separator containing phosphazene derivative for nonaq.-  
       **electrolyte** double layer capacitor)

L26 ANSWER 7 OF 11 HCPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 2004:589783 HCPLUS Full-text  
 DOCUMENT NUMBER: 141:126373  
 TITLE: Separator for nonaqueous **electrolyte**  
       battery  
 INVENTOR(S): Kanno, Hiroshi; Otsuki, Masashi; Eguchi,  
       Shinichi  
 PATENT ASSIGNEE(S): Bridgestone Corporation, Japan  
 SOURCE: PCT Int. Appl., 32 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2004062002	A1	20040722	WO 2003-JP16360	200312 19
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM,				

AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE,  
 DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,  
 SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML,  
 MR, NE, SN, TD, TG  
 AU 2003289453 A1 20040729 AU 2003-289453  
 200312  
 19  
 EP 1603175 A1 20051207 EP 2003-780936  
 200312  
 19  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
 PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,  
 SK  
 CN 1732580 A 20060208 CN 2003-80107738  
 200312  
 19  
 US 20060073381 A1 20060406 US 2005-540837  
 200506  
 27  
 US 7585587 B2 20090908  
 PRIORITY APPLN. INFO.: JP 2002-380683 A  
 200212  
 27  
 WO 2003-JP16360 W  
 200312  
 19

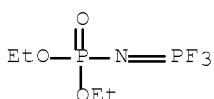
AB The separator, which is incombustible even when the inside of a battery has a high temperature and useful for a primary or secondary Li battery, comprises a micro-porous film formed by adding a phosphazene derivative and/or an isomer of a phosphazene derivative to a polymer.

IT 722454-84-4 722454-86-6 724792-59-0

RL: DEV (Device component use); USES (Uses)  
 (separators containing phosphazene derivative added polymers for primary and secondary lithium batteries)

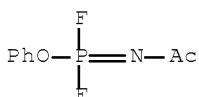
RN 722454-84-4 HCPLUS

CN Phosphoramicidic acid, (trifluorophosphoranylidene)-, diethyl ester (9CI) (CA INDEX NAME)

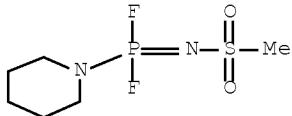


RN 722454-86-6 HCPLUS

CN Phosphorodifluoridimidic acid, acetyl-, phenyl ester (9CI) (CA INDEX NAME)



RN 724792-59-0 HCAPLUS

CN Phosphonimidic difluoride, N-(methylsulfonyl)-P-1-piperidinyl- (9CI)  
(CA INDEX NAME)

IC ICM H01M002-16

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq ~~electrolyte~~ battery incombustible  
separator phosphazene deriv added polymer

IT Primary battery separators

Secondary battery separators

(separators containing phosphazene derivative added polymers for primary  
and secondary lithium batteries)

IT 7439-93-2, Lithium, uses

RL: DEV (Device component use); USES (Uses)

(anode; separators containing phosphazene derivative added polymers for  
primary and secondary lithium batteries)IT 1313-13-9, Manganese dioxide, uses 12190-79-3, Cobalt lithium  
oxide (CoLiO<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)

(cathode; separators containing phosphazene derivative added polymers for  
primary and secondary lithium batteries)IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate

105-58-8, Diethyl carbonate 957-13-1 1184-10-7 2397-48-0

9002-88-4, Polyethylene 14283-07-9, Lithium tetrafluoroborate

33027-68-8 722454-84-4 722454-86-6

724792-59-0

RL: DEV (Device component use); USES (Uses)

(separators containing phosphazene derivative added polymers for primary  
and secondary lithium batteries)

IT 724792-60-3

RL: DEV (Device component use); USES (Uses)

(separators containing phosphazene derivative added polymers for primary  
and secondary nonaq. ~~electrolyte~~ batteries)REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L26 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2004:570217 HCAPLUS Full-text

DOCUMENT NUMBER: 141:126304

TITLE: Additive for secondary battery  
nonaqueous ~~electrolyte~~ solution and  
the battery

INVENTOR(S): Otsuki, Masashi; Horikawa, Yasuro

PATENT ASSIGNEE(S): Bridgestone Corporation, Japan

SOURCE: PCT Int. Appl., 33 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

November 13, 2009

10/540,558

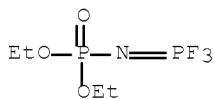
19

FAMILY ACC. NUM. COUNT: 1

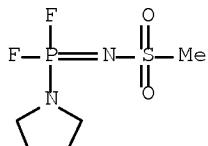
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004059782	A1	20040715	WO 2003-JP16592	200312 24
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW	RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
AU 2003292764	A1	20040722	AU 2003-292764	200312 24
EP 1580832	A1	20050928	EP 2003-768180	200312 24
EP 1580832	B1	20091104		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
CN 1732588	A	20060208	CN 2003-80107739	200312 24
CN 100362689	C	20080116		
US 20060046151	A1	20060302	US 2005-540558	200506 24
PRIORITY APPLN. INFO.:			JP 2002-377142	A
				200212 26
			WO 2003-JP16592	W
				200312 24

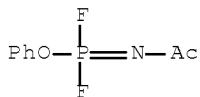
- AB The additive comprises a phosphazene derivative represented by R13P = N-X (R1 = halo or monovalent substituent; and X = C, Si, N, P, O and/or S containing organic group). The battery has a nonaq. electrolyte solution comprising the above additive, a cathode, and an anode.
- IT 722454-84-4 722454-85-5 722454-86-6  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (additives containing phosphazene derivs. for secondary battery electrolytes)
- RN 722454-84-4 HCPLUS
- CN Phosphoramicidic acid, (trifluorophosphoranylidene)-, diethyl ester (9CI) (CA INDEX NAME)



RN 722454-85-5 HCAPLUS

CN Phosphonimidic difluoride, N-(methylsulfonyl)-P-1-pyrrolidinyl-  
(9CI) (CA INDEX NAME)

RN 722454-86-6 HCAPLUS

CN Phosphorodifluoridimidic acid, acetyl-, phenyl ester (9CI) (CA  
INDEX NAME)

IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery nonaq electrolyte  
additive phosphazene deriv

IT Battery electrolytes

(additives containing phosphazene derivs. for secondary  
battery electrolytes)

IT Secondary batteries

(lithium; additives containing phosphazene derivs. for  
secondary battery electrolytes)IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>) 21324-40-3, Lithium  
hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(additives containing phosphazene derivs. for secondary  
battery electrolytes)

IT 2397-48-0 722454-84-4 722454-85-5

722454-86-6

RL: MOA (Modifier or additive use); USES (Uses)

(additives containing phosphazene derivs. for secondary  
battery electrolytes)REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

November 13, 2009

10/540,558

21

DOCUMENT NUMBER: 141:132681  
 TITLE: Phosphazene derivative additives for nonaqueous electrolytic solution and nonaqueous electrolyte electric double-layer capacitors  
 INVENTOR(S): Otsuki, Masashi; Horikawa, Yasuro  
 PATENT ASSIGNEE(S): Bridgestone Corporation, Japan  
 SOURCE: PCT Int. Appl., 31 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2004059671	A1	20040715	WO 2003-JP16585	200312 24
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW	RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG	AU 2003292758	AU 2003-292758	200312 24
EP 1577913	A1	20050921	EP 2003-768173	200312 24
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK	CN 1732541	A	20060208	CN 2003-80107740 200312 24
US 20060092596	A1	20060504	US 2005-540565	200506 24
PRIORITY APPLN. INFO.:			JP 2002-377128	A 200212 26
			WO 2003-JP16585	W 200312 24

AB The title additives in the nonaq. electrolytic solns. for elec. double-layer capacitors are phosphazene derivs. R13P=N (R1 = halo, monovalent substituent; X = organic group containing C, Si, N, P, O, S). The additives have high dissoln. power for supporting salts and a low viscosity. A nonaq. electrolyte elec. double-layer capacitors provided with the title electrolytic solution

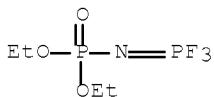
containing the additives have excellent fast or high-rate charge-discharge characteristics.

IT 722454-84-4P 722454-85-5P  
722454-86-6P

RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)  
(phosphazene derivative additives for nonaq.  
electrolytic solution and nonaq. electrolyte elec.  
double-layer capacitors)

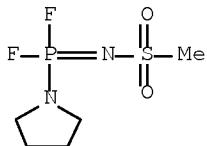
RN 722454-84-4 HCPLUS

CN Phosphoramicidic acid, (trifluorophosphoranylidene)-, diethyl ester  
(9CI) (CA INDEX NAME)



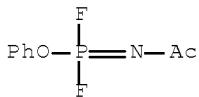
RN 722454-85-5 HCPLUS

CN Phosphonimidic difluoride, N-(methylsulfonyl)-P-1-pyrrolidinyl-  
(9CI) (CA INDEX NAME)



RN 722454-86-6 HCPLUS

CN Phosphorodifluoridimidic acid, acetyl-, phenyl ester (9CI) (CA  
INDEX NAME)



IC ICM H01G009-038

CC 76-10 (Electric Phenomena)

ST phosphazene additive nonaq electrolyte fast  
charging double layer capacitor

IT Electric double layer

(capacitors; phosphazene derivative additives for nonaq.  
electrolytic solution and nonaq. electrolyte elec.  
double-layer capacitors)

IT Phosphazenes

RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
(derivs., additives; phosphazene derivative  
additives for nonaq. electrolytic solution and  
nonaq. electrolyte elec. double-layer capacitors)

IT Capacitors  
(double layer, nonaq. electrolytic solns. containing phosphazene additives; phosphazene derivative additives for nonaq. electrolytic solution and nonaq. electrolyte elec. double-layer capacitors)

IT Dissolution  
(of salts, in electrolytic solution; phosphazene derivative additives for nonaq. electrolytic solution and nonaq. electrolyte elec. double-layer capacitors)

IT Electrolytic solutions  
(phosphazene derivative additives for nonaq. electrolytic solution and nonaq. electrolyte elec. double-layer capacitors)

IT Viscosity  
(salts, in phosphazene-containing electrolyte solution; phosphazene derivative additives for nonaq. electrolytic solution and nonaq. electrolyte elec. double-layer capacitors)

IT Solubility  
(saturation, of salts, in electrolytic solution; phosphazene derivative additives for nonaq. electrolytic solution and nonaq. electrolyte elec. double-layer capacitors)

IT 2397-48-0P  
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)  
(phosphazene additive, in nonaq. electrolytic solution; phosphazene derivative additives for nonaq. electrolytic solution and nonaq. electrolyte elec. double-layer capacitors)

IT 722454-84-4P 722454-85-5P  
722454-86-6P  
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)  
(phosphazene derivative additives for nonaq. electrolytic solution and nonaq. electrolyte elec. double-layer capacitors)

IT 429-06-1, Tetraethylammonium tetrafluoroborate  
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
(saturation solubility in phosphazene-containing electrolytic solution; phosphazene derivative additives for nonaq. electrolytic solution and nonaq. electrolyte elec. double-layer capacitors)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 2004:139816 HCAPLUS Full-text  
DOCUMENT NUMBER: 140:184695  
TITLE: Secondary nonaqueous electrolyte battery  
INVENTOR(S): Narioka, Yoshinori; Mori, Sumio  
PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese

November 13, 2009

10/540,558

24

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

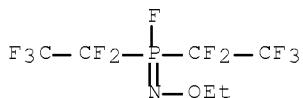
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004055208	A	20040219	JP 2002-208280	200207 17
PRIORITY APPLN. INFO.:			JP 2002-208280	200207 17

AB The battery has an active mass containing anode and a Li salt dissolved nonaq. electrolyte solution; where the electrolyte solution has a halo-containing phosphazene compound and the anode has a binder comprising a non-halo material.

IT 657348-91-9  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. having halo-containing phosphazene compds. for secondary lithium batteries)

RN 657348-91-9 HCPLUS

CN Phosphinimidic fluoride, N-ethoxy-P,P-bis(pentafluoroethyl)- (9CI)  
 (CA INDEX NAME)



IC ICM H01M010-40  
 ICS H01M004-02; H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary battery electrolyte halo contg  
 phosphazene compd; anode binder nonhalo compd secondary  
 battery

IT Fluoropolymers, uses  
 Styrene-butadiene rubber, uses  
 RL: DEV (Device component use); USES (Uses)  
 (anode binder; anode binders containing non-halo materials for  
 secondary lithium batteries)

IT Battery anodes  
 (anode binders containing non-halo materials for secondary lithium  
 batteries)

IT Battery electrolytes  
 (electrolyte solns. having halo-containing phosphazene  
 compds. for secondary lithium batteries)

IT Secondary batteries  
 (secondary lithium batteries having halo-containing  
 phosphazene compds. in electrolyte solns. and non-halo  
 materials in anodes)

IT 7782-42-5, Graphite, uses  
 RL: DEV (Device component use); USES (Uses)  
 (anode active mass; anode binders containing non-halo materials for  
 secondary lithium batteries)

IT 24937-79-9, Pvdf  
 RL: DEV (Device component use); USES (Uses)

(anode binder; anode binders containing non-halo materials for secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
21324-40-3, Lithium hexafluorophosphate 657348-91-9

RL: DEV (Device component use); USES (Uses)  
(electrolyte solns. having halo-containing phosphazene  
compds. for secondary lithium batteries)

IT 9003-55-8

RL: DEV (Device component use); USES (Uses)  
(styrene-butadiene rubber, anode binder; anode binders containing  
non-halo materials for secondary lithium batteries)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS  
RECORD (1 CITINGS)

L26 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1999:327314 HCAPLUS Full-text

DOCUMENT NUMBER: 131:87959

TITLE: Chemistry of Diazaphospholephosphines. 2.  
Exocyclic Phosphine-Sulfido, -Selenido, and  
-Imido Derivatives of a Diazaphospholephosphine  
System. Crystal and Molecular Structures of Two  
Diazaphospholephosphine Imines:  
4-(Difluoro((p-cyanotetrafluorophenyl)imino)phos-  
phorano)-2,5-dimethyl-2H-1,2,3σ2-diazaphos-  
phole and  
4-(Bis(dimethylamino)((pentamethylcyclopentadie-  
nyl)dichlorotitanio)imino)phosphorano)-2,5-dimet-  
hyl-2H-1,2,3σ2-diazaphosphole

AUTHOR(S): Mikoluk, Michael D.; McDonald, Robert; Cavell,  
Ronald G.

CORPORATE SOURCE: Department of Chemistry, University of Alberta,  
Alberta, AB, T6G 2G2, Can.

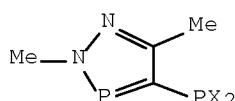
SOURCE: Inorganic Chemistry (1999), 38(12), 2791-2801  
CODEN: INOCAJ; ISSN: 0020-1669

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

GI



I

AB The substituted-exo-phosphine diazaphospholephosphines I (X = F, NMe<sub>2</sub>, OCH<sub>2</sub>CF<sub>3</sub>) are exclusively oxidized at this center with either chalcogens (S, Se) or azides to phosphoranodiazaphospholes. Oxidation imparts a dramatic upfield shift of the phosphorus NMR signals and an increase in the 1JPC coupling consts. within the ring. (Difluorophosphino)diazaphosphole was also oxidized with selected amines using di-Et azodicarboxylate (DAD) as the coupling agent. Bulky amines (e.g., 2,4,6-tri-tert-butylaniline (mes\*)) gave the monomeric iminophosphorane whereas less bulky amines (p-toluidine) formed mostly the cyclic diazadiphosphetidine. The crystal and mol. structure of

4-(difluoro((p-cyanotetrafluorophenyl)imino)phosphorano)-2,5-dimethyl-2H-1,2,3σ2-diazaphosphole was determined: triclinic, P.hivin.1 (Number 2),  $a = 7.2744(15)$  Å,  $b = 10.087(4)$  Å,  $c = 10.566(2)$  Å,  $\alpha = 66.62(2)^\circ$ ,  $\beta = 77.60(2)^\circ$ ,  $\gamma = 78.14(3)^\circ$ ,  $V = 688.8(4)$  Å<sup>3</sup>,  $Z = 2$ . Final indexes are  $R_1 = 0.0368$  and  $wR_2 = 0.0968$ , and for all data,  $R_1 = 0.0478$ ,  $wR_2 = 0.1033$ , and GOF = 1.067. The structure revealed two planar ring systems consisting of the diazaphosphole and the p-tetrafluorophenyl (tfbn) ring with an angle of 26.3° between the rings. The angle about the phosphine imine nitrogen (i.e., P:N-tfbn) is relatively open (141.2(2)°), and the P:N bond length is relatively short (1.514(2) Å).

((Trimethylsilyl)imino)(bis(dimethylamino))phosphorano)diazaphosphole gave, with Cp<sup>\*</sup>TiCl<sub>3</sub>, [(η<sub>5</sub>-C<sub>5</sub>Me<sub>5</sub>)TiCl<sub>2</sub>(N:P(NMe<sub>2</sub>)<sub>2</sub>(2,5-dimethyl-2H-1,2,3σ2-diazaphosphol-4-yl))], which was also characterized structurally: monoclinic, P2<sub>1</sub> (Number 4),  $a = 11.9477(11)$  Å,  $b = 8.4757(6)$  Å,  $c = 12.7567(11)$  Å,  $\beta = 108.824(8)^\circ$ ,  $V = 1222.7(2)$  Å<sup>3</sup>,  $Z = 2$ . Final indexes are  $R_1 = 0.0630$  and  $wR_2 = 0.1593$ , and for all data,  $R_1 = 0.0768$ ,  $wR_2 = 0.1973$ , and GOF = 1.081. The Ti-N-P angle of 161.0(5)° was large, and the P:N distance (1.592(6) Å) and the Ti-N distance (1.781(6) Å) were both slightly shorter than those in similar titanium complexes. The P-N single bond distances between the exo-phosphorus atom and the attached dimethylamino groups were also short (1.649 Å (average)). These short values suggest delocalized bonding character throughout the metal-ligand framework, possibly a consequence of addnl. conjugation through the diazaphosphole ring.

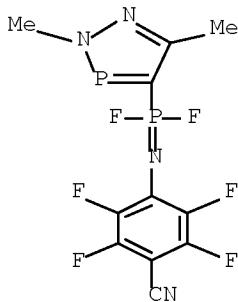
IT 229974-08-7P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(preparation and crystal structure of)

RN 229974-08-7 HCPLUS

CN Phosphonimidic difluoride, N-(4-cyano-2,3,5,6-tetrafluorophenyl)-P-(2,5-dimethyl-2H-1,2,3-diazaphosphol-4-yl)- (CA INDEX NAME)

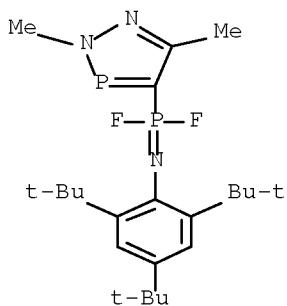


IT 229974-09-8P 229974-10-1P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

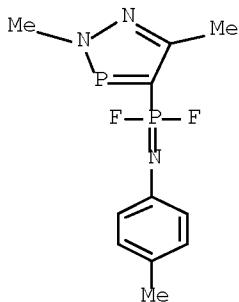
RN 229974-09-8 HCPLUS

CN Phosphonimidic difluoride, P-(2,5-dimethyl-2H-1,2,3-diazaphosphol-4-yl)-N-[2,4,6-tris(1,1-dimethylethyl)phenyl]- (CA INDEX NAME)



RN 229974-10-1 HCAPLUS

CN Phosphonimidic difluoride, P-(2,5-dimethyl-2H-1,2,3-diazaphosphol-4-yl)-N-(4-methylphenyl)- (CA INDEX NAME)



CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 75

IT 229974-08-7P 229974-17-8P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(preparation and crystal structure of)

IT 74582-13-1P 229974-07-6P 229974-09-8P  
229974-10-1P 229974-11-2P 229974-12-3P 229974-13-4P  
229974-14-5P 229974-15-6P 229974-16-7P

RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation of)

OS.CITING REF COUNT: 14 THERE ARE 14 CAPLUS RECORDS THAT CITE THIS  
RECORD (14 CITINGS)REFERENCE COUNT: 47 THERE ARE 47 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

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